

Controlling Dust With Curtain Walls

Chuck Ashelin, Engineering Manager, Zoneworks

Controlling dust and other airborne particulate in a facility is essential for quality control and, more importantly, is a matter of safety.

Any company involved in a process handling operation or generating particulate matter will benefit from dust control practices. Woodworking, painting,



powdered ingredients/spice mixing and packaging, ceramic cutting/grinding, powdered chemical processing and packaging are just a few of the applications for which it is critical.

Don't sacrifice quality - or safety

At the very least, dust or particulate matter in the air is a nuisance. However, it can cause serious quality and safety issues as well. As a nuisance, particulates generated from mixing powdered chemicals and other materials can settle on surfaces significant distances from the operation if containment equipment is not in place. Dust on neighboring equipment, furniture, office equipment, windows and floors becomes a constant drain on cleaning and maintenance resources. As a contaminate affecting product quality, uncontrolled particulate matter can spoil or degrade batches of differing critical materials, especially in chemical processing.

From a safety standpoint, there are many circumstances where high enough concentration of airborne dust sized particulate in a closed space can become explosive or flammable. Often this can occur with seemingly innocuous products - those we wouldn't normally associate with an explosion hazard. Additionally, airborne dust can be a health hazard to employees. These hazards can range from a skin, eye or bronchial irritation to more serious issues for people with asthma. Most serious can be the potential for particulates to cause lung disease like cancer (extremely thorough dust control is a critical component in asbestos remediation).

Standard dust control methods

There are a several methods that facilities use to keep particulate from one space spreading into another space and contaminating it. These include:

- Local exhaust – a high velocity airflow stream captures particles at the point they are generated and carries them away.
- Exhaust with filtration – a high velocity airflow stream captures particles and recirculates them through a filter medium, where they are removed.
- Area exhaust – a high volume exhaust fan draws air from the full room volume to an outside vent or recirculates through a filtration/separation device.
- Barrier separation – simply a wall or partition between affected areas.

Curtain walls increase efficiency of dust control

All of the separation methods outlined above rely on moving a volume of air containing the dust particles. This is generally accomplished through the use of exhaust fans through ducts. A local exhaust set up would incorporate some type of hood designed to collect the air and particulate being moved and funnel it into the exhaust ductwork. Area exhaust would include multiple draw points through louvered openings in the ceiling or wall. Either of these methods could, and most likely would, include some type of filtration or particle separator in line to remove particulate from the air stream. This is necessary prior to either recirculation of the air back into the space, or discharge of the air into the atmosphere.

Curtain walls can significantly improve the effectiveness of these systems, as well as offer the opportunity for cost savings, both in the initial cost of the equipment, as well as in direct operating cost.

Anytime a space is to be exhausted, the smaller the space can be made, the smaller the exhaust equipment can be as specified. Partitioning around a dust source with a curtain wall takes full advantage of this relationship. By reducing the volume of the space to be exhausted, smaller fan(s) can be used, with less total air movement being required. Lower air velocity through filter media increases the effective particle separation of the device. Additionally, lower air flow through the filter reduces the frequency required for change out or cleaning.

In some cases, an application will include a temperature differential as well between a dust controlled space and the area surrounding it. Curtain walls are available with several levels of insulation, as needed. These walls can be instrumental in maintaining product integrity and ensuring employee comfort around the space.

An effective barrier on their own

Controlling Dust With Curtain Walls

Published on Chem.Info (<http://www.chem.info>)



In addition to reducing the volume of space to be exhausted, curtain walls act as a very effective physical barrier on their own, blocking transfer of dust particles from space to space. Curtain walls can be single layer fabric, or multi-layer insulated. They can easily be fitted with clear vision panels for visual communication between spaces. They are naturally flexible, yet very durable, as evidenced by their ability to withstand contact from machinery or product, and simply “bend without breaking,” in contrast to a hard permanent wall.

They are also relatively easy to re-configure if a space needs to be enlarged or reduced, or the shape of the space footprint needs to change. No “de-constructing” is required. Curtain walls are easily installed, can be simply trimmed around conduit, piping, ductwork, etc., and can be anchored to the floor to withstand pressure differential across them. Depending on the application, a curtain wall can be suspended from the room ceiling, or they can be supplied with a standalone framework to hang from. They are available as stationary as well as sliding (suspended from roller track), and can be fitted with strip curtains, personnel doors, or high speed industrial doors for full range of access to the space.

Curtain walls can be a smart choice for facilities looking to control dust. As a simple and economical way to partition space, they make exhaust and separation systems for dust more efficient. And – regardless of the application – their flexibility, reconfigurable nature and ease of installation saves companies time and money.

Controlling Dust With Curtain Walls

Published on Chem.Info (<http://www.chem.info>)

Source URL (retrieved on 11/28/2014 - 2:55pm):

<http://www.chem.info/articles/2014/06/controlling-dust-curtain-walls>